



Rocky Mountain  
Remediation Services, L.L.C.  
... protecting the environment

Rocky Flats Environmental Technology Site  
P.O. Box 464  
Golden, Colorado 80402-0464  
Phone: (303) 966-7000

CORRES. CONTROL

LTR. NO.

Originator Ltr Log #

WJM-004-00

00 - RF-

DIST.	LTR/ENC
CARMEAN, C. H.	
CRAWFORD, A. C.	
GUINN, L. A.	
HUGHES, F. P.	
LAW, J. E.	
KORENKO, M. K.	X X
TRICE, K. D.	
WHEELER, M.	
WOLF, K. A.	
MCANDREW, W.J.	

CAIMI, C. P. X X

ADMIN RECORDS	X X
RMRS RECORDS	X X
CORRES CONTROL	
TRAFFIC	
PATS/T130G	

CLASSIFICATION:

UCNI	
UNCLASSIFIED	
CONFIDENTIAL	
SECRET	

AUTHORIZED CLASSIFIER  
SIGNATURE:

Date:

IN REPLY TO RF CC NO.:

ACTION ITEM STATUS:

- ☐ PARTIAL/OPEN  
☐ CLOSED

LTR APPROVALS:

Vice Pres:

Director:

Manager:

ORIG. & TYPIST INITIALS:

WJM:hed

RF-46469 (Rev. 3/99)

February 7, 2000

Gary M. Voorheis  
Kaiser-Hill Company, L.L.C.  
Engineering & Nuclear Safety Programs  
Building 111

BUILDING 776/777 DEVIATION FROM DES-210 PROCUREMENT REQUIREMENTS  
WJM-004-00

Ref: Brian J. Henderson ltr, BJH-003-98, to H. Sanders, Deviation from DES-210  
Procurement Requirements, May 18, 1998

PURPOSE

The intent of this proposal is to put forth a plan of action for the Building 776/777 Closure Project to deviate from Site procedures DES-210 and DES-273 criteria regarding the procurement level (PL) requirement for procurement of components. This deviation request is similar to that granted to Buildings 779 and 771. (See attached)

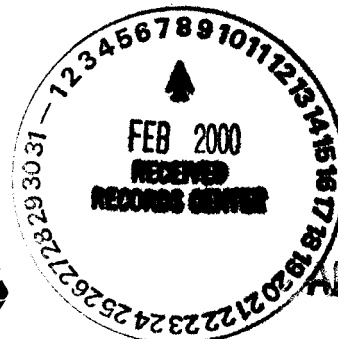
DISCUSSION

It is the position of the Building 776/777 engineering team, that the type of boundary control required during Decontamination and Decommissioning evolutions, should be evaluated by Engineering, Operations, and Radiation Engineering on a case-by-case basis as these systems are breached. In many cases, bagging and taping is an adequate and cost effective method of isolation.

The project will be able to isolate and remove entire systems from service. However, the building heating, ventilation, and air conditioning (HVAC) system will remain in service throughout the life of the project. The HVAC system will constantly be modified as gloveboxes are taken off-line and rooms are stripped of all systems.

A calculation was completed for Building 779, addressing the use of PL-3 materials installed in a worst case scenario in these systems. The calculation is also valid for Building 776/777. With Building 776/777 Closure Team Engineering approval, any material having strength and corrosion resistance equal to or greater than that specified in the calculation may be used for temporary boundary isolation. The Calculation Number CALC-779-HVAC-000052 is attached.

At project completion, final system/utility termination will conform to the requirements of DES-210 and will be inspected by Facilities Inspection.



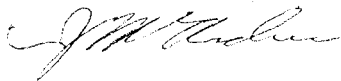
000032  
IA- R776-A-00022

Gary M. Voorheis  
February 7, 2000  
WJM-004-00  
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Once approved, the approval letter and engineering calculation will be referenced in applicable engineering orders for the Building 776/777 Closure Project. The Integrated Work Control Program packages for glovebox and equipment removal in Building 776/777 will be developed to ensure that all materials used for system isolation reflect the requirements for the calculation.

RESPONSE REQUIREMENTS

Please review the above process and approve via letter of concurrence/approval. If you have any questions or concerns, you can contact me at extension 5454.



W. J. McAndrew  
Director  
RMRS Engineering

WJM:hed

Attachments:  
As Stated (3)

cc:  
S. K. Crowe  
J. C. Gilmour  
H. L. Saunders



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## INTEROFFICE MEMORANDUM

DATE: March 18, 1999  
TO: Brian Henderson, 779 Closure Project, Bldg. 706, X6560  
FROM: Dave Ruscitto, Engineering, Bldg. 130, X6032 *D. Ruscitto*  
SUBJECT: DEVIATION FROM DES-210 PROCUREMENT REQUIREMENTS – DGR-030-99  
REF: Brian Henderson letter (BH-010-99) to John Gilmour, Same Subject, March 17, 1999

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The purpose of this correspondence is to document Kaiser-Hill approval of your proposal to utilize PL-3 material in lieu of the required PL-1 and PL-2 material on Building 771/774 ductwork systems during the decommissioning and decontamination (D&D) process.

The calculation, included as an attachment to the above referenced letter, provides evidence that the PL-3 material can perform its intended duty well above the maximum allowable stresses produced by the existing building fan systems. Kaiser-Hill Engineering is imposing the following requirements: [1] Each time a new flange is applied, the Integrated Work Control Program (IWCP) work package shall contain a signed document indicating the flange meets the plate thickness that is specified in the calculation. [2] If another material is to be substituted for the flange, another calculation shall be performed for the new material and included in the work package. It is not required to send the new calculation to Kaiser-Hill Engineering. [3] If the systems using the flanges remain in place for longer than a six-month period, an engineering analysis shall be performed to determine the corrosion compatibility for the dissimilar material of the ductwork and flange.

This approval is only for the ventilation ductwork systems. If a lesser material is requested to be used in other systems (e.g. process drains), an additional engineering justification for deviation shall be required.

If you have any questions please contact John Gilmour at extension 8153.

JCG:clf

cc:  
Carl Caimi  
John Gilmour  
Dave Harrahy  
File



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COMPANY

## INTEROFFICE MEMORANDUM

DATE: June 18, 1998

TO: Brian Henderson, 779 Closure Project, Bldg. 706, X6560

FROM: Dave Ruscitto, Engineering, Bldg. 130, X6032 *DR*

SUBJECT: DEVIATION FROM DES-210 PROCUREMENT REQUIREMENTS  
DGR-042-98

REF: Brian Henderson letter (BJH-003-98) to Howard Saunders, same subject,  
May 18, 1998

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The purpose of this correspondence is to acknowledge Kaiser-Hill Design Engineering review of your proposal to utilize PL-3 material in lieu of the required PL-1 and PL-2 material on Building 779's ductwork system during the decommissioning and decontamination (D&D) process.

Your calculation, included as an attachment to the above-referenced letter, provides evidence that the PL-3 material can perform its intended duty well above the maximum allowable stresses produced by the existing building fan systems. Kaiser Hill Engineering is imposing the following requirements: [1] Each time a new flange is applied, the Integrated Work Control Program (IWCP) work package shall contain a signed document indicating the flange meets the plate thickness that is specified in the calculation. [2] If another material is to be substituted for the flange, another calculation shall be performed on the new material and included in the work package. It is not required to send the new calculation to Kaiser-Hill Design Engineering. [3] If the systems using the flanges remain in place for longer than a six-month period, an engineering analysis shall be performed to determine the corrosion-compatibility for the dissimilar material of the ductwork and flange.

If a lesser material is requested to be used in the other systems mentioned in your letter (i.e., process drains and fire sprinkler systems), an engineering justification for deviation shall be required. This should also be in the form of an engineering calculation.

Brian Henderson  
June 18, 1998  
DGR-042-98  
Page 2

It is to be noted that the approval of this deviation is only authorized for the D&D work in Building 779, and shall not constitute universal approval on other D&D projects outside of Building 779.

If you have any questions, please contact Howard Saunders at extension 5914.

CWD:clf

cc:  
Steve Crowe  
Charles DuPré  
John Gilmour  
Howard Gilpin  
Bill McAndrew  
Howard Saunders  
File

## Calculation/Technical Basis Cover Sheet and Revision Summary

## Section 1: IDENTIFICATION

1. IWCP/Authorization Project Number KT03PE00	2. Modification Description Title Duct End Plate Thickness Determination		3. Page 1 of 3
4. Use of Form <input checked="" type="checkbox"/> Calculation <input type="checkbox"/> Engineering Analysis <input type="checkbox"/> Software Installation or Change <input type="checkbox"/> Technical Basis	5. Job Title HVAC Ducts End Plate Thickness Determination		
6. Calculation Number/Assigned Document Control No. CALC - 779 - HVAC -000052	7. Affected Building Nos. 779	8. Room Various	9. Floor Various
10. System ID HVAC	11. System Category <input type="checkbox"/> 1 & 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4	12. Natural Phenomena Category (PC) <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> N/A	

## Section 2: PREPARATION, REVIEW AND APPROVAL

13. Rev. No.		14. Designer/ Date	15. Design Checker(s)/ Date	16. Independent Verifier(s)/Date	17. Responsible Engineering Manager/Date	18. Landlord	19. Supersedes Calc. No. or Rev. No.	20. Field Confirm Required (✓)
0	Print Name  Sign  Date	S.N. PUROHIT <i>S.N. Purohit</i> 5-27-98	V. ISAIAN <i>V. Isaian</i> 5-28-98	NA	A. EDEN <i>A. Eden</i> 5/28/98	B. Henderson <i>B. Henderson</i> 5/28/98	NA	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Print Name  Sign  Date							<input type="checkbox"/> Yes <input type="checkbox"/> No
	Print Name  Sign  Date							<input type="checkbox"/> Yes <input type="checkbox"/> No

### Section 3: REVISION SUMMARY

[illegible]

## Calculation/Technical Basis Sheet

## Section 1: IDENTIFICATION

1. IWCP/Authorization Project Number KT03PE00	2. Modification Description Title Duct End Plate Thickness Determination	3. Page 2 of 3
4. Calculation Number/Assigned Control Number CALC - 779 - HVAC - 000052	5. Rev. No. 0	

## Section 2: OBJECTIVE, METHODS, ASSUMPTIONS, REFERENCES, AND CONCLUSION

## 6. Objective (Both Functional and Structural Requirements)

The objective of this calculation is to determine the required thickness of the end plate for the ducts of various sizes ( 2", 4", 6", 8", 10", and 12" ) with a negative pressure of 20" W. G. The end plate is taped on the existing flang of the duct.

## 7. Method

The calculation method is a simple manual determination of the end plate thickness using elastic stress formula for a circular and solid plate with edges supported and subjected to uniform pressure loading over entire surface.

## 8. Assumptions and Technical Basis

The end plate is taped to the existing duct flange and not welded to the flange.

## 9. Design Inputs/ References

9A. Ref. No.	9B. Inputs/References (with Revision and/or Date or Source)
1 & 2	1. Formulas for Stress and Strain, Fourth Edition; By R. J. Roark 2. ASME B31.3-1996 Edition Piping Code.

## 10. Conclusions

The required thickness of the end plate for various sizes (2", 4", 6", 8", 10", and 12") ducts have been determined based on calculated thickness of the end plate for allowable stress in the stainless steel plate on page 3 of this calculation.

## Calculation Sheet

## Section 1: CALCULATION IDENTIFICATION

1. Calculation Number CALC - 779 - HVAC - 000052	2. Revision Number 0	3. IWCP/Authorization Project Number KT03PE00	4. Page 3 of 3
5. Modification Description/Title Duct End Plate Thickness Determination		6. Designer (Print Name) S. N. PUROHIT	
		7. Design Checker (Print Name)	

## Section 2: CALCULATION

The end plate is supported on the edges of the existing duct flange. Due to negative pressure of 20" W. G. pressure in the duct, the maximum radial (hoop) and tangential stress in the plate can be expressed as below:

$$S_r = S_t = \frac{3W}{8\pi m t^2} (3m+1) \text{ psi at center of plate} \quad (\text{Ref. 1 page 216})$$

Where,  $W = \text{Total applied load in lbs.}$   
 $= W \pi r^2$

$W = \text{Unit applied load (pressure) in this case}$   
 $= \frac{20" \text{ W.G.}}{27.69 \text{ in}^2/\text{psi}} = 0.7223 \text{ psi}$

$r = \text{Radius of plate, inches}$   
 subjected to pressure;

$m = \frac{1}{\nu} (\text{Poisson's Ratio}) = \frac{1}{0.3} \text{ for stainless steel}$

$S = S_r = S_t = \text{Allowable stress conservatively}$   
 16,700 psi lowest for plates & sheets  
 of stainless steel with  $S_y = 25,000 \text{ psi}$   
 (Ref. 2 pages 178 thru 180)

Therefore,  $S = \frac{3 \times P \pi r^2}{8 \pi \times \frac{1}{2} \times t^2} \left[ \left( 3 \times \frac{1}{0.3} \right) + 1 \right]$

or  $t = \left\{ \left[ \frac{0.9 \times P \times r^2}{8 S} \right] \times 11 \right\}^{1/2}$

Tabulated are calculated & required thickness of end plate for various sizes of ducts.

Duct Size in	Calculated Thickness of End plate, in	Required Thickness of end plate in gauge, in.
2"	0.0073"	Use 22 gauge (0.0293" THK)
4"	0.0146"	Use 22 gauge (0.0293" THK)
6"	0.0219"	Use 22 gauge (0.0293" THK)
8"	0.0293"	Use 20 gauge (0.0355" THK)
10"	0.0366"	Use 18 Gauge (0.048" THK)
12"	0.0439"	Use 18 Gauge plate